

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

CARNEGIE MELLON UNIVERSITY,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civil No. 09-290
	)	
MARVELL TECHNOLOGY GROUP, LTD.,	)	
and MARVELL SEMICONDUCTOR, INC.,	)	
	)	
Defendants.	)	

**Memorandum of Email Communication with Technical Advisor**  
Before Judge Nora Barry Fischer

Hearing begun: N/A

Hearing concluded: N/A

Hearing adjourned to: N/A

Stenographer: N/A

**WITNESSES:**

For Plaintiff

For Defendant

In advance of the Telephone Conference with Dr. Costello scheduled for March 23, 2011 at 1:30 p.m., the Court sent the following questions to Dr. Costello by email this day: (1) Are there any areas of U.S. Pat. No. 6,282,251 (“the Seagate patent” or “the Worstell patent”) that you do not understand, or that do not make sense to you, that you would like to hear directly from the parties’ experts? (2) What does it mean to say that a Viterbi detector is suboptimum? What is the significance of this classification? (3) What does it mean to say that “noise in a system is colored?” (4) What is a tap weight  $W_i$  configuration? Does the Seagate patent include application of multiple different tap weight  $W_i$  configurations to a plurality of signal samples for any trellis branches at a certain time index? Do U.S. Pat. Nos. 6,201,839 and 6,438,180? What is the significance of these configurations? (5) What is correlated noise in a filter or equalizer, as compared to transition noise? Does the Seagate patent account for both? (6) What is a hidden state within the context of a conventional Viterbi detector? (7) In Equation 20 of the Seagate patent, does the term  $X_{b,nt}$  represent a plurality or a single signal sample for time  $nt$ ? (8) Does the Seagate patent teach that the tap weight  $W_i$  configuration of the Viterbi detector 24 accounts for both signal-independent correlated noise, as well as signal-dependent correlated noise? What is the significance of this distinction? (9) In relation to Equation 20 of the Seagate patent, is either the transition noise multiplier or the transition noise adjustment applied to a plurality of signal samples from different time instances or to the single branch metric  $B_{b,nt}$ ? What is the significance of this distinction? (10) In the Seagate patent, does the FIR filter use a single tap weight  $W_i$  configuration, as determined by Equation 11? What is the significance of this configuration? (11) Are the tap weight  $W_i$  configurations of the front-end FIR filter 22 and Viterbi detector 24 fixed at the design or programming stage or are they adaptive, i.e., can they

change over time during operation of the Viterbi detector? What is the significance of this distinction? (12) Does the Seagate patent disclose the step of selecting a branch metric function for each of the branches at a certain time index? What is the significance of this disclosure or nondisclosure? (13) Does the Seagate patent disclose the step of applying each of the selected branch metric functions to a plurality of signal samples to determine the metric value corresponding to the branch for which the applied metric function was selected? What is the significance of this disclosure or nondisclosure? (14) Does the Seagate patent disclose a step of selecting branch metric functions in a Viterbi detector? What is the significance of this disclosure or nondisclosure?